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CHAPTER TWO: GROUND MOUNTED SIGN INSTALLATION

The installation of ground mounted signs involves the furnishing of approved materials, and the erecting of traffic supports and signs according to the Specifications and the contract plans. In this chapter the installation of ground mounted signs is discussed for pre-construction, construction inspection, and measurement and payment duties.

TRAFFIC SIGNS

For ground mounted sign installation, the following items are required to be reviewed:

1) Sections **802**, **910.14**, and **911.02**.

2) "Standard Highway Signs", and FHWA publication "Standard Highway Sign Booklet 1979". (To order write: U.S. Department of Transportation FHWA 400 7th St. W. Washington, D.C. 20590. Attention: Superintendent of Documents).

3) Indiana Manual on Uniform Traffic Control Devices for highway construction and maintenance operations. (Pages 37-40.)

PRE-CONSTRUCTION DUTIES

Generally speaking, sheet signs are mounted on square posts and panel signs (Figure 2-1) are mounted on structural steel posts. The technician is required to familiarize himself with both the plan sheets and the quantity sheets of the contract plans to determine what kind of sign and support goes where. Before any work is started on a contract and preferably before the pre-construction conference, the R/W distances as shown on the plans are required to be checked. This may usually be done by reviewing old road plans held by the District Development Department.

Figure 2-1. Panel Sign

SHOP DRAWINGS (Section 802.04)

1) Closely examine the sign shop drawings. The dimensions as shown on the shop drawings override the dimensions as shown on the plan and quantity sheets.

2) Each sign location is required to be field checked.

3) Locate the station or mile designation as shown on the plans.

4) Verify that the location is acceptable for the visibility of the driver on the main line pavement and does not block the view of any driver on the approaches.

INSTALLATION OF SIGNS (Section 802.08)

1) Paint the sign designation as the sign appears on the plans at the edge of the pavement. Do not paint over the white edge if edge line re-stripping is planned before sign installation.

2) Calculate and locate the horizontal offset from the edge of pavement to each sign support for the purpose of checking the sign support lengths as shown in the quantity sheets. Some calculations are required since the distances are usually given to the edge of the sign.

REMOVAL AND RESET REFERENCE SIGNS (Section 802.10)

1) Refer to the sheet sign shop drawing hole punching details which accompany the plans for spacing of the channel posts. Refer to the panel sign shop drawings for the panel sign size. The supports are located at the 1/5 and 4/5 points of the panel size.

2) Do not permanently mark this location because the Contractor is responsible for this after all the utilities have been located.

3) The vertical distance between the edge of pavement and ground level at each sign support is required to be calculated. A string level or a hand-held level works nicely for this operation.

4) For square posts: Length of Sign Supports = (Embedment Length)+(Sign Clearance Above Edge of Pvt.)+(Height of Sign Duties From The Shop Drawings)+/-(Vertical Distance Between Edge of Pavement And Ground Level Of Sign Support)

5) For structural steel posts: Length of Sign Support = (Sign Clearance Above The Ground) + (Height of Sign From The Shop Drawings + 2 inches) – (Break-away Stub Height Above The Ground) +/- (Vertical Distance Between Edge of Pavement And Ground Level Of Sign Support). See Standard **802-SNGS-10**

REMOVAL AND RELOCATION (Section 802.09)

A summary table is required to be prepared comparing the support lengths as shown in the quantity sheets with the support lengths as determined from field measurement. This table is used for the following purposes:

1) To check the Contractor's calculations on the procedure described above.

2) To prepare any change orders necessary to cover any quantity changes in either channel posts or structural steel posts

3) To alert Central Office Traffic Design of incorrectly sized structural steel if the field calculated structural steel post lengths exceed planned by more than 2 or 3 ft.

CONSTRUCTION INSPECTION DUTIES

After all utilities have been located, the Contractor stakes the locations of all sign supports. All signs are placed at the proper elevation above the edge of pavement and at the proper offset, leveled, and oriented correctly. The contract personnel are given no less than two days notice in advance of any staking of inspection required.

INSTALLATION OF CHANNEL POSTS

When inspecting the installation of channel posts the following items are required to be considered:

1) The Basis For Approval for steel flanged channel posts depends upon the quantity used. Refer to the latest edition of the Frequency Manual for the frequency of samples and tests.

2) All posts are required to meet utility clearance requirements.

3) No portion of a sign may overhang the R/W line.

4) Posts are not driven in a ditch line.

5) Posts are driven to the depth as shown on the sign detail sheets.

6) Posts are installed plumb.

7) Back to back posts are bolted together and driven simultaneously.

8) For a two post installation, the second post is leveled to the 1 in. holes of the first post driven in order for the sign to be placed level.

9) Any post bent, damaged, or unfit for use in the finished work is removed from the site and replaced with an acceptable post with no additional payment.

INSTALLATION OF SHEET SIGNS

When inspecting the installation of sheet signs, the following items are required to be considered:

1) The Basis For Approval for traffic signs is a Type C Certification. (W #)

2) Sheet signs are installed level on the channel posts.

REFLECTIVE SHEETING (Section 913.10)

Sheet signs are fastened to the channel posts as follows:

1) Place a plastic washer against the sign face with a metal washer.

2) Insert a bolt through the metal washer against the plastic washer, the sign face, the post, the lock washer, and the nut.

3) After the bolts have been hand tightened snug, the bolt head is held by a wrench to prevent any movement of the washer or bolt head while the nut is being tightened.

4) Do not over tighten the nut to prevent twisting of the sign sheeting or denting of the sign metal. Refer to Standard **802-SNGS-04** & **07**.

INSTALLATION OF STRUCTURAL STEEL POSTS

When inspecting the installation of structural steel wide flange (WF) posts, (Figure 2-2) the following items are required to be considered:

1) The Basis For Approval for structural steel is a Type C Certification. The Basis For Approval for reinforcing steel is the "J" number. The Basis For Approval for the concrete is the sequence number reported on the IT 652.

2) The foundation excavation is required to be completed to levels and dimensions as shown in the plans. If bed rock or boulders are encountered during excavation, they are removed to the depth on the plans. The Contractor may use

a foundation casing if unstable soil conditions are anticipated or encountered.

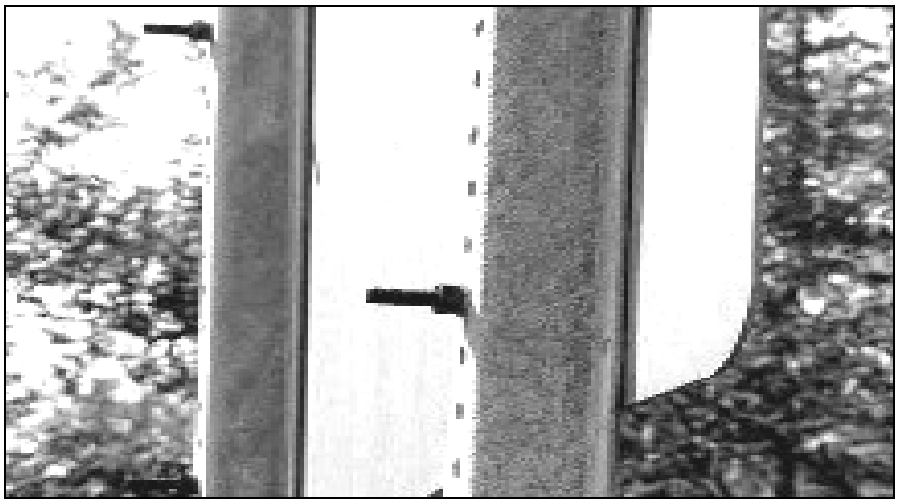

Figure 2-2. Sheet Sign on Channel Posts

3) Excavated material not used in the backfill is removed within 24 h.

4) For foundations over 5 ft deep, a tremie is used until the concrete is within 5 ft of the top of the foundation.

5) The concrete is finished flush with the finished grade.

6) The break-away wide flange stubs (Figure 2-3) is placed plumb and to the proper height above the finished grade as shown on Standard **802-SNGP- 01**. A maximum of 4 in. is critical for the proper break-away. If the top of the break-away stub is level, the upper posts do not need shimming.

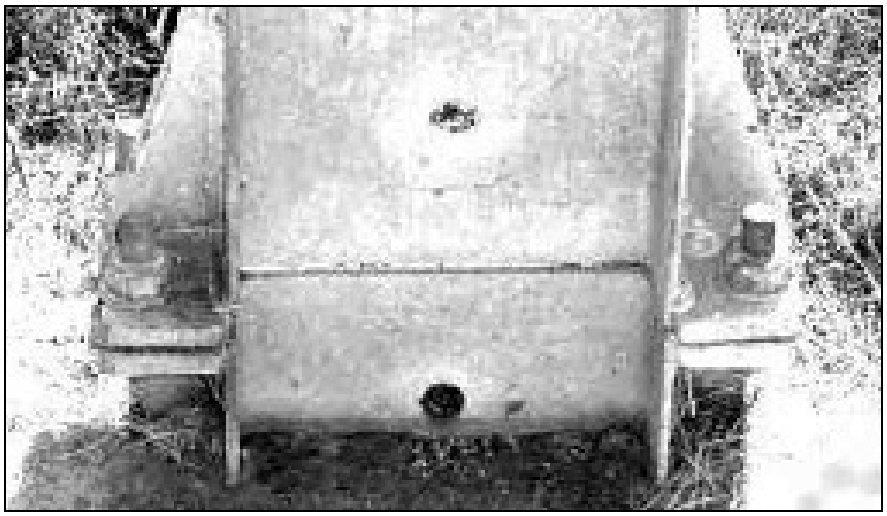

Figure 2-3. Structural Steel Post on a Break-Away Stud

7) The break-away stubs are installed prior to ordering the posts. This means that the final length of the break-away posts is determined by using the difference in elevation between the edge of pavement and the top of the break-away stub.

8) The break-away posts come to the job site assembled and torqued to the design specifications.

9) The break-away posts are installed plumb, using the proper bolts, washers, and nuts, and in the proper sequence as shown on Standard **802-SNGP-02.**

10) The back plates are required to be level between post #1 and post #2.

INSTALLATION OF PANEL SIGNS

When inspecting the installation of panel signs (Figure 2-4), the following items are required to be considered:

1) The Basis For Approval for panel signs is a Type C Certification.

2) Panel signs are installed level on the wide flange posts and are placed a minimum of 1 in. above the fuse plate as shown on Standard **802-SNGP-06.**

3) The 1/5 and 4/5 points of the sign are marked and are required to correspond with the centers of the wide flange posts.

4) Panel sign clips are attached to each sign support. The top and bottom of the panel sign are clipped to both sides of the wide flange post. The intermediate clips at one foot spacing are staggered on either side of the wide flange post.

5) If a secondary panel sign, such as an exit sign, is mounted on top of the primary panel sign, two type B channel posts are used to support the secondary sign. The length of these Type B channel posts is required to be 3 ft plus the height of the secondary sign. Sign clips are attached as described above.

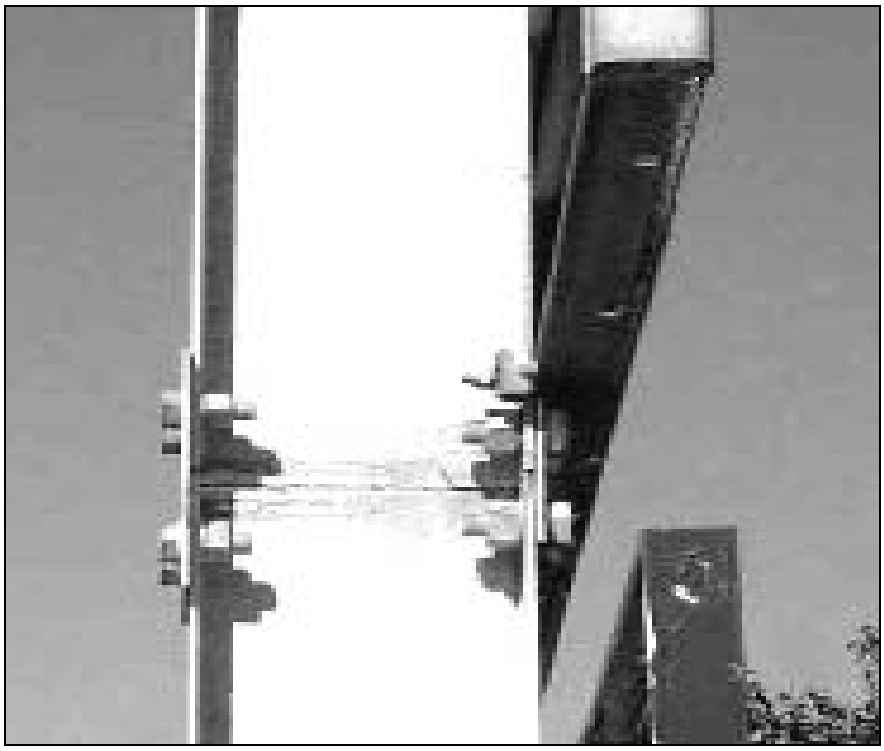

Figure 2-4. Panel Sign on Structural Steel Posts

MEASUREMENT AND PAYMENT

Proper measurement and documentation of the installed ground mounted sign and support is essential for maintaining the progressive estimate, paying the Contractor, filling out the material records, and completing the final construction record.

Items used in the installation of ground mounted signs are measured and paid for as follows:

1) Concrete dimensions are measured along neat lines and paid for by cubic yard.

2) Reinforcing steel is measured by the length and paid for in pounds after conversion according to Section **703.08**.

3) Structural steel is measured by the length and paid for in pounds after conversion. The weights of the base stiffener plates, fuse plates, and back plates are added to the weight of the posts according to the Miscellaneous Standard Sheet.

4) Channel posts are measured by the square foot and paid for to the nearest foot.

5) Sheet signs are measured by the square foot as determined by the maximum length and width of the sheet metal required to produce the sheet sign.

6) Panel signs, including legend and/or copy, are measured and paid for by the square foot. Where sheet signs are placed on panel signs, they are measured and paid for separately.

7) Sign hardware (Figure 2-5) necessary to mount signs to existing or new ground mounted sign structures is included in the bid price for the sign face.

Figure 2-5. Ground Sign Hardware